



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,880	11/16/2001	David T. Bailey	HAU199 CON	6268
7590	02/26/2004		EXAMINER	
Steven C. Petersen Hogan & Hartson, LLP Suite 1500 1200 17th Street Denver, CO 80202			GRiffin, WALTER DEAN	
			ART UNIT	PAPER NUMBER
			1764	
DATE MAILED: 02/26/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/001,880	BAILEY ET AL.
	Examiner	Art Unit
	Walter D. Griffin	1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 16 November 2001.
2a) This action is **FINAL**. 2b) This action is non-final.
3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-52 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-52 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 16 November 2001 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 100102.

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) Notice of Informal Patent Application (PTO-152)
6) Other: _____.

DETAILED ACTION

Claim Objections

Claim 30 is objected to because of the following informalities: The word "prior" in line 1 is incorrect. It should apparently be "period". Also, the word "form" in line 2 of claim 30 is incorrect. It should apparently be "from".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 31, 34, 36, and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Rebeller et al. (US 4,320,050).

The Rebeller reference discloses a method for extracting carotenoids such as β -carotene from plant material such as algae. The process comprises contacting the plant material with a single non-acidic organic solvent for a period of time sufficient to extract the carotenoids including β -carotene (e.g., 10 to 45 minutes). An extraction liquid solution comprising a solvent and solubilized carotenoids is recovered by filtration. The solvent is then evaporated from the extraction liquid solution to leave a residue that contains the carotenoids. The solvent recovered in the evaporation step may be reused. See col. 3, line 23 through col. 4, line 14.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 3, 5, 9-17, and 49-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rebeller et al. (US 4,320,050) in view of Surmatis (US 3,989,757) and Invention Certificate 3302060/2813 to Kazaryan et al. (hereinafter "Kazaryan").

The Rebeller reference discloses a method for extracting carotenoids such as β -carotene from plant material such as algae. The process comprises contacting the plant material with a single organic solvent for a period of time sufficient to extract the carotenoids including β -

carotene (e.g., 10 to 45 minutes). An extraction liquid solution comprising a solvent and solubilized carotenoids is recovered by filtration. The solvent is then evaporated from the extraction liquid solution to leave a residue that contains the carotenoids. The solvent recovered in the evaporation step may be reused. See col. 3, line 23 through col. 4, line 14.

The Rebeller reference does not disclose the heating of the carotenoids for a time and temperature to isomerize the carotenoids and subsequently washing the isomerized product. The Rebeller reference also does not disclose the filter pore size range of claim 9 and does not disclose the claimed evaporation temperature.

The Surmatis reference discloses that cis-carotenoids may be isomerized to trans-carotenoids by heating the cis-carotenoids for a time and at a temperature sufficient to cause isomerization. Temperatures above 50°C are sufficient. Temperatures of about 50° to 120°C are preferred. Time of heating is not critical with 20 hours usually being sufficient. The isomerization of β -carotene is specifically disclosed. See col. 1, lines 56-60; col. 2, line 58 through col. 3, line 24; and example 2.

The Kazaryan reference discloses the washing of carotene with a cold solvent that is similar to the solvent (i.e., an alcohol) used in the process of Rebeller. See example 1, page 6.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by including the isomerization steps of Surmatis because trans isomers are generally more valuable than the cis isomers.

Regarding the claimed temperatures and times of the isomerization, it would have been obvious to utilize the claimed temperatures and times because such conditions are disclosed as

not being critical as long as the temperature is greater than 50°C and therefore any conditions having temperatures greater than 50°C would be expected to result in isomerization.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the combined teachings of Rebeller and Surmatis by washing as suggested by Kazaryan because pure crystals will be obtained. The temperature would necessarily be chosen so that crystals would be formed or so that crystals would not be lost through melting. Washing with the same solvent as is used in the extraction step is suggested since the solvent of Kazaryan is chemically and physically similar to the extraction solvent of Rebeller. Both solvents are alcohols.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by utilizing the claimed filter pore size range because one would choose any pore size including that which is claimed as long as the pore size permits the recovery of an extraction solution of sufficient purity.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by utilizing the claimed evaporation temperature because any elevated temperature would be effective as long as the temperature does not result in adverse or unwanted reactions.

Claims 2, 4, and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rebeller et al. (US 4,320,050) in view of Surmatis (US 3,989,757) and Invention Certificate 3302060/2813 to Kazaryan et al. (hereinafter "Kazaryan") as applied to claims 1 and 3 above, and further in view of Haigh (US 5,310,554).

The previously discussed references do not disclose the use of heptane solvent, the claimed algae starting material, or the removal of emulsifying agents.

The Haigh reference discloses that carotenoids can be extracted from plant materials including Dunaliella salina. Haigh also discloses that heptane can be used as the solvent and also discloses an ultrafiltration step prior to extraction. See col. 3, line 38 through col. 4, line 4.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the previously discussed references by extracting carotenoids from the algae disclosed by Haigh because the algae is disclosed as containing β -carotene as does the algae disclosed by Rebeller. Therefore, the substitution of the algae of Haigh for that of Rebeller would result in the expectation of the recovery of β -carotene.

Regarding the heptane solvent, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by utilizing heptane as a solvent as suggested by Haigh because it is disclosed as being effective in extracting carotenoids and because it falls within the general class of solvents (i.e., light organic solvent that is easy to recover) disclosed by Rebeller.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by subjecting the plant material to ultrafiltration as suggested by Haigh because the plant material will be dewatered. This step would necessarily remove emulsifying agents.

Claims 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rebeller et al. (US 4,320,050) in view of Surmatis (US 3,989,757), Invention Certificate 3302060/2813 to Kazaryan et al. (hereinafter "Kazaryan") and Haigh (US 5,310,554).

The Rebeller reference discloses a method for extracting carotenoids such as β -carotene from plant material such as algae. The process comprises contacting the plant material with a single organic solvent for a period of time sufficient to extract the carotenoids including β -carotene (e.g., 10 to 45 minutes). An extraction liquid solution comprising a solvent and solubilized carotenoids is recovered by filtration. The solvent is then evaporated from the extraction liquid solution to leave a residue that contains the carotenoids. The solvent recovered in the evaporation step may be reused. See col. 3, line 23 through col. 4, line 14.

The Rebeller reference does not disclose the heating of the carotenoids for a time and temperature to isomerize the carotenoids and subsequently washing the isomerized product. The Rebeller reference also does not disclose the claimed evaporation temperature, does not disclose ultrafiltration, does not disclose the specifically claimed algae, and does not disclose a heptane solvent.

The Surmatis reference discloses that cis-carotenoids may be isomerized to trans-carotenoids by heating the cis-carotenoids for a time and at a temperature sufficient to cause isomerization. Temperatures above 50°C are sufficient. Temperatures of about 50° to 120°C are preferred. Time of heating is not critical with 20 hours usually being sufficient. The isomerization of β -carotene is specifically disclosed. See col. 1, lines 56-60; col. 2, line 58 through col. 3, line 24; and example 2.

The Kazaryan reference discloses the washing of carotene with a cold solvent that is similar to the solvent (i.e., an alcohol) used in the process of Rebeller. See example 1, page 6.

The Haigh reference discloses that carotenoids can be extracted from plant materials including *Dunaliella salina*. Haigh also discloses that heptane can be used as the solvent and also discloses an ultrafiltration step prior to extraction. See col. 3, line 38 through col. 4, line 4.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by including the isomerization steps of Surmatis because trans isomers are generally more valuable than the cis isomers.

Regarding the claimed temperatures and times of the isomerization, it would have been obvious to utilize the claimed temperatures and times because such conditions are disclosed as not being critical as long as the temperature is greater than 50°C and therefore any conditions having temperatures greater than 50°C would be expected to result in isomerization.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the combined teachings of Rebeller and Surmatis by washing as suggested by Kazaryan because pure crystals will be obtained. The temperature would necessarily be chosen so that crystals would be formed or so that crystals would not be lost through melting. Washing with the same solvent as is used in the extraction step is suggested since the solvent of Kazaryan is chemically and physically similar to the extraction solvent of Rebeller. Both solvents are alcohols.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by utilizing the claimed evaporation temperature because any elevated temperature would be effective as long as the temperature does not result in adverse or unwanted reactions.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Rebeller process by extracting carotenoids from the algae disclosed by Haigh because the algae is disclosed as containing β -carotene as does the algae disclosed by Rebeller. Therefore, the substitution of the algae of Haigh for that of Rebeller would result in the expectation of the recovery of β -carotene. Regarding the heptane solvent, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by utilizing heptane as a solvent as suggested by Haigh because it is disclosed as being effective in extracting carotenoids and because it falls within the general class of solvents (i.e., light organic solvent that is easy to recover) disclosed by Rebeller.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by subjecting the plant material to ultrafiltration as suggested by Haigh because the plant material will be dewatered. This step would necessarily remove emulsifying agents.

Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Surmatis (US 3,989,757).

The Surmatis reference discloses that cis-carotenoids may be isomerized to trans-carotenoids by heating the cis-carotenoids for a time and at a temperature sufficient to cause isomerization. Temperatures above 50°C are sufficient. Temperatures of about 50° to 120°C are preferred. Time of heating is not critical with 20 hours usually being sufficient. The isomerization of β -carotene is specifically disclosed. See col. 1, lines 56-60; col. 2, line 58 through col. 3, line 24; and example 2.

The Surmatis reference does not disclose the initial and reduced temperatures as claimed.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Surmatis and utilize the claimed temperatures and times because temperatures and times are disclosed as not being critical as long as the temperature is greater than 50°C and therefore any conditions having temperatures greater than 50°C would be expected to result in isomerization.

Claims 27, 29, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rebeller et al. (US 4,320,050) in view of Surmatis (US 3,989,757) and Invention Certificate 3302060/2813 to Kazaryan et al. (hereinafter "Kazaryan").

The Rebeller reference discloses a method for extracting carotenoids such as β -carotene from plant material such as algae. The process comprises contacting the plant material with a single organic solvent for a period of time sufficient to extract the carotenoids including β -carotene (e.g., 10 to 45 minutes). An extraction liquid solution comprising a solvent and solubilized carotenoids is recovered by filtration. The solvent is then evaporated from the extraction liquid solution to leave a residue that contains the carotenoids. The solvent recovered in the evaporation step may be reused. See col. 3, line 23 through col. 4, line 14.

The Rebeller reference does not disclose the heating of the carotenoids for a time and temperature to isomerize the carotenoids and subsequently washing the isomerized product.

The Surmatis reference discloses that cis-carotenoids may be isomerized to trans-carotenoids by heating the cis-carotenoids for a time and at a temperature sufficient to cause isomerization. Temperatures above 50°C are sufficient. Temperatures of about 50° to 120°C are preferred. Time of heating is not critical with 20 hours usually being sufficient. The

Art Unit: 1764

isomerization of β -carotene is specifically disclosed. See col. 1, lines 56-60; col. 2, line 58 through col. 3, line 24; and example 2.

The Kazaryan reference discloses the washing of carotene with a cold solvent that is similar to the solvent (i.e., an alcohol) used in the process of Rebeller. See example 1, page 6.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by including the isomerization steps of Surmatis because trans isomers are generally more valuable than the cis isomers.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the combined teachings of Rebeller and Surmatis by washing as suggested by Kazaryan because pure crystals will be obtained. The temperature would necessarily be chosen so that crystals would be formed or so that crystals would not be lost through melting. Washing with the same solvent as is used in the extraction step is suggested since the solvent of Kazaryan is chemically and physically similar to the extraction solvent of Rebeller. Both solvents are alcohols.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rebeller et al. (US 4,320,050) in view of Surmatis (US 3,989,757) and Invention Certificate 3302060/2813 to Kazaryan et al. (hereinafter "Kazaryan") as applied to claim 27 above, and further in view of Haigh (US 5,310,554).

The previously discussed references do not disclose the use of a heptane solvent.

The Haigh reference discloses that heptane can be used as the solvent in the extraction of carotenoids from plant materials. See col. 3, line 38 through col. 4, line 4.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the previously discussed references by utilizing heptane as a solvent as suggested by Haigh because it is disclosed as being effective in extracting carotenoids and because it falls within the general class of solvents (i.e., light organic solvent that is easy to recover) disclosed by Rebeller.

Claims 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rebeller et al. (US 4,320,050).

The Rebeller reference discloses a method for extracting carotenoids such as β -carotene from plant material such as algae. The process comprises contacting the plant material with a single non-acidic organic solvent for a period of time sufficient to extract the carotenoids including β -carotene (e.g., 10 to 45 minutes). An extraction liquid solution comprising a solvent and solubilized carotenoids is recovered by filtration. The solvent is then evaporated from the extraction liquid solution to leave a residue that contains the carotenoids. The solvent recovered in the evaporation step may be reused. See col. 3, line 23 through col. 4, line 14.

The Rebeller reference also does not disclose the filter pore size range of claim 40 and does not disclose the claimed evaporation temperature.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by utilizing the claimed filter pore size range because one would choose any pore size including that which is claimed as long as the pore size permits the recovery of an extraction solution of sufficient purity.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by utilizing the claimed

Art Unit: 1764

evaporation temperature because any elevated temperature would be effective as long as the temperature does not result in adverse or unwanted reactions.

Claims 32 and 43-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rebeller et al. (US 4,320,050) in view of Surmatis (US 3,989,757) and Invention Certificate 3302060/2813 to Kazaryan et al. (hereinafter "Kazaryan").

The Rebeller reference discloses a method for extracting carotenoids such as β -carotene from plant material such as algae. The process comprises contacting the plant material with a single non-acidic organic solvent for a period of time sufficient to extract the carotenoids including β -carotene (e.g., 10 to 45 minutes). An extraction liquid solution comprising a solvent and solubilized carotenoids is recovered by filtration. The solvent is then evaporated from the extraction liquid solution to leave a residue that contains the carotenoids. The solvent recovered in the evaporation step may be reused. See col. 3, line 23 through col. 4, line 14.

The Rebeller reference does not disclose the heating of the carotenoids for a time and temperature to isomerize the carotenoids and subsequently washing the isomerized product.

The Surmatis reference discloses that cis-carotenoids may be isomerized to trans-carotenoids by heating the cis-carotenoids for a time and at a temperature sufficient to cause isomerization. Temperatures above 50°C are sufficient. Temperatures of about 50° to 120°C are preferred. Time of heating is not critical with 20 hours usually being sufficient. The isomerization of β -carotene is specifically disclosed. See col. 1, lines 56-60; col. 2, line 58 through col. 3, line 24; and example 2.

The Kazaryan reference discloses the washing of carotene with a cold solvent that is similar to the solvent (i.e., an alcohol) used in the process of Rebeller. See example 1, page 6.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by including the isomerization steps of Surmatis because trans isomers are generally more valuable than the cis isomers.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Surmatis and utilize the claimed temperatures and times because temperatures and times are disclosed as not being critical as long as the temperature is greater than 50°C and therefore any conditions having temperatures greater than 50°C would be expected to result in isomerization.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the combined teachings of Rebeller and Surmatis by washing as suggested by Kazaryan because pure crystals will be obtained. The temperature would necessarily be chosen so that crystals would be formed or so that crystals would not be lost through melting. Washing with the same solvent as is used in the extraction step is suggested since the solvent of Kazaryan is chemically and physically similar to the extraction solvent of Rebeller. Both solvents are alcohols.

Claims 33, 35, 38, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rebeller et al. (US 4,320,050) in view of Haigh (US 5,310,554).

The Rebeller reference discloses a method for extracting carotenoids such as β -carotene from plant material such as algae. The process comprises contacting the plant material with a single non-acidic organic solvent for a period of time sufficient to extract the carotenoids including β -carotene (e.g., 10 to 45 minutes). An extraction liquid solution comprising a solvent and solubilized carotenoids is recovered by filtration. The solvent is then evaporated from the

Art Unit: 1764

extraction liquid solution to leave a residue that contains the carotenoids. The solvent recovered in the evaporation step may be reused. See col. 3, line 23 through col. 4, line 14.

The Rebeller reference does not disclose ultrafiltration, does not disclose the specifically claimed algae, and does not disclose a heptane solvent.

The Haigh reference discloses that carotenoids can be extracted from plant materials including Dunaliella salina. Haigh also discloses that heptane can be used as the solvent and also discloses an ultrafiltration step prior to extraction. See col. 3, line 38 through col. 4, line 4.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Rebeller process by extracting carotenoids from the algae disclosed by Haigh because the algae is disclosed as containing β -carotene as does the algae disclosed by Rebeller. Therefore, the substitution of the algae of Haigh for that of Rebeller would result in the expectation of the recovery of β -carotene. Regarding the heptane solvent, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by utilizing heptane as a solvent as suggested by Haigh because it is disclosed as being effective in extracting carotenoids and because it falls within the general class of solvents (i.e., light organic solvent that is easy to recover) disclosed by Rebeller.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Rebeller by subjecting the plant material to ultrafiltration as suggested by Haigh because the plant material will be dewatered. This step would necessarily remove emulsifying agents.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art not relied upon discloses carotenoid recovery processes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter D. Griffin whose telephone number is (571) 272-1447. The examiner can normally be reached on Monday-Friday 6:30 to 4:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Calderola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Walter D. Griffin
Primary Examiner
Art Unit 1764

WG
February 20, 2004